REMARKS/ARGUMENTS

1. Claim rejections – 35 U.S.C. 112

Claims 21 and 33 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Response

Claims 21 and 33 have respectively been amended by canceling the words "every two", so the phrase reads 'actual time interval between adjacent reference events'. As respective base claims 18 and 30 both refer to 'an imprecise timer for repeatedly triggering a reference event' it will be appreciated that adjacent reference events refers to a first reference event directly preceding a second reference event.

2. Claim rejections – 35 U.S.C. 103(a)

Claims 1, 3, 5, 9, 11, and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Chapman.

Response

Claim 1

Claim 1 discloses a system for correcting an imprecise timer wherein the system initially **only** tracks a first time interval and corrects for errors accordingly, then determines if a count value reaches a threshold value after said error correction, wherein if this is true no more tracking of time intervals (and therefore no more error compensation) will occur. In other words, each compensation value corresponding to each

time interval is determined separately, and there is **no accumulation of error values**. Kawai discloses a system wherein a period between interrupt pulses is measured, and compared with a desired period to generate a fractional value. The fractional value is then used to multiply a measured period of a plurality of pulses: "For example, if an ideal value for a period of the second basic clock signal is 1.0 msec and an actual value of the period thereof is 1.2 msec, then the corrective coefficient for the clock timer 14 is calculated as "1/1.2". The calculated corrective coefficient is then set in the clock timer 14 in step S8. The calculated corrective coefficient is subsequently used to multiply a numerical value up to which clock pulses of the second basic clock signal as the system clock signal are counted by the clock timer 14" [Col.9, lines 16 – 25]. This assumes that the amount by which the actual clock period differs from an ideal period is constant, whereas Claim 1 discloses an imprecise timer, therefore each time period must be tracked and compensated separately. Calculation is selectively performed, thereby saving considerable processing time if only a first compensation value needs to be calculated.

The system disclosed by Chapman is for maintaining timing of an interrupt-driven clock wherein "interrupts (are) separated by a fixed time period" [Col.6, lines 59 – 60]. In this case, the amount of error of each individual time period is determined by dividing a total error value by a number of time intervals. Chapman also discloses **accumulating** error values and only compensating for errors after said accumulated errors reach a certain predetermined value, wherein said predetermined value is greater than the threshold value: "The present invention performs correction for time keeping inaccuracy only after some amount of error has been allowed to accumulate" [Col.5, lines 12 – 14] and "Some number other than 1,000,000 could be used as long as it were larger than the one minute interval and preferably contained many one minute intervals to obtain the benefits of reduced processor loading and greater resolution of adjustment accuracy" [Col.5, lines 37 – 41]. As Claim 1 discloses an **imprecise** timer, it is necessary to compensate for each individual time period **separately**. Moreover, it is possible that only

one time period has an associated error value, therefore correction of a single time period is sufficient for correcting the inaccuracy of the timer.

If Kawai were to be combined with Chapman, it would result in a system wherein actual time periods differ from ideal time periods by a fixed value, error values are accumulated over a period of time greater than the threshold value, and only corrected according to when this period of time is reached. Claim 1 describes a method where no errors are accumulated, individual compensation values are only determined according to a comparison between the count value and the threshold value and correction according to each time interval occurs individually.

Additionally, Claim 1 has been amended to include the limitation of "the first compensation value being an integer" and is supported at least by specification paragraph [0031]. In Election/Restriction Office actions for this application dated 10/04/2005 and again on 11/16/2005, the applicant was required to select between two "patentably distinct" species "best illustrated in paragraph 0031, lines 6-11" and "best illustrated in paragraph 0031, lines 11-18". The difference between these two "patentably distinct" species is that in the former species, the compensation value is an integer while in the later species, the compensation value is a floating point.

Presumably included in the Examiner's reasons for these species being "patentably distinct" is an awareness of different real world results depending upon which species was employed in the present application. Kawai clearly uses non-integer coefficients as compensation values (Col.10, lines 18-23, 36-40) and replacing them with integers compensation values would, in the illustrated example (Col.10, lines 14-28), cause the device of Kawai to obviously malfunction. Any modification of a reference that makes it unsatisfactory for its intended purpose is not obvious (MPEP 2143.01) and Kawai should therefore not be combined with any reference teaching integer coefficients.

On the other hand, the Examiner may be suggesting not merely substituting integer

coefficients for float coefficients, but be suggesting substituting the entire clock correction mechanism of Chapman into the framework of Kawai and has suggested that Chapman teaches an integer compensation value (Col.6, lines 1-5). It is noted that said text says "6144 plus the parts per million accumulated error". Col.5, lines 23-42 clearly and specifically teaches the actual time period is defined as a "period between interrupts from the idle timer 26" and the ideal time period is defined as "2.384186 microseconds". The "parts per million accumulated error" is specifically calculated as a "time difference error (actual minus ideal) is multiplied by 1,000,000 and divided by the ideal time period". Remembering that the ideal time period is defined as "2.384186 microseconds", the applicant asserts that utilizing this formula will not result in a compensation value which is an integer except possibly in extremely rare situations such as exact integer multiples of the ideal time period, which if present, eliminates the need for a compensation value at all. Because this formula does not yield an integer result, the applicant asserts that either "6144 plus the parts per million accumulated error" will not be an integer or the device of Chapman will fail to correct for inaccuracies except in those extremely rare cases. Putting a failed device into Kawai would make Kawai also fail, and is therefore not obvious.

Applicant therefore believes Claim 1 should be found allowable.

Claims 3, 5, 9, 11, and 12

Claims 3, 5, 9, 11, and 12 are dependent on Claim 1. As applicant believes Claim 1 has been placed in a position for allowance, claims 3, 5, 9, 11, and 12 should also be found allowable.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of

Chapman and further in view of Lode.

Response

Claim 4 is dependent on Claim 1 and should be found allowable if Claim 1 is found allowable.

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Chapman and further in view of Hirose.

Response

Claim 6 is dependent on Claim 1 and should be found allowable if Claim 1 is found allowable. Additionally, please see arguments for Claim 1 concerning the use of integer versus float compensation values.

Claims 13, 15, 17, 30 – 32, and 34 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Chapman and further in view of Progar.

Response

Claim 13

Claim 13 is a system claim that utilizes the method detailed in Claim 1. As stated above, each compensation value is utilized for individual error correction, wherein the condition for calculating a next compensation is dependent on a comparison between the threshold and the count value. In other words, if the count value equals the threshold value then no compensation value will be calculated. If the count value does not equal the threshold value then a first compensation value will be calculated, the count value will

again be compared with the threshold value and if they are not equal a second compensation value will be calculated. In the stated prior arts, calculation of the error values happens independently of the count value threshold value comparison, wherein if there is no error, calculation will still be determined. In Claim 13, compensation values are only determined if a comparison is deemed to be unequal, therefore if the timer is precise for a certain period of time no compensation values are determined, **and no time interval is tracked.** This therefore significantly saves on calculation processes. Kawai, Chapman, and Progar all claim accumulating error values over a period of time until the error value or the time value is equal to a predetermined threshold, then adding all accumulated error values at one time to correct for the error.

Re the Examiner's comment that Progar selectively tracks time intervals, it should be noted that Progar does not error compensate at this point, and continues to track time intervals until an accumulated error value reaches a predetermined value at which point error compensation will occur: "Each time, in this embodiment, that register 20 outputs a "minute increment signal to register 27, microprocessor 12 generates a fractional error signal representing the time value of the fractional error associated with one minute (i.e., 1,792 microseconds) and selectively outputs this time value to accumulator 22. Accumulator 22 maintains a "running total" of these received fractional error values by sequentially and receivably adding the error value of each of the received fractional error signals to its presently contained value, thereby additively updating the contained present value....once the contained value exceeds a certain threshold value, accumulator 22 generates a signal to microprocessor 12.....thereby causing the contained value within the accumulator 22 to be reset" [Col.5, lines 19 – 41]. Therefore, error compensation is not dependent on a comparison between threshold and count value, but only dependent on amount of error detected. Furthermore, Chapman claims a timer wherein each period is fixed (as detailed under response to Claim 1), therefore it is necessary to correct for all time periods. Claim 13 claims an imprecise timer, wherein it is possible that only a first time interval is incorrect, and therefore only correction of the first time interval is

required. Such a limitation is not claimed by Kawai, Chapman, or Progar, and therefore applicant believes Claim 13 should be found allowable.

Claims 15 and 17

Claims 15 and 17 are dependent on Claim 13. As applicant believes Claim 13 has been placed in a position for allowance, claims 15 and 17 should also be found allowable.

Claim 30

Claim 30 has been amended to further clarify that only if the count value does not equal the threshold value after initial compensation will a second compensation value be determined. In other words, originally, only a first compensation value is determined and applied to the count value, wherein if the count value then equals the threshold value, no more compensation will be required. As neither Kawai, Chapman, nor Progar teach compensating for each individual time period separately, and instead teach accumulating error values over a predetermined period of time **greater than adjacent interrupt pulses**, the applicant asserts that Claim 30 provides a new unanticipated step to a method for correcting a timer. The advantage of this method of calculation is that errors can be immediately corrected, and less calculation is required, as there is no need to accumulate error values.

Claims 31 – 32, and 34

Claims 31 – 32, and 34 are dependent on Claim 30. As applicant believes Claim 30 has been placed in a position for allowance, claims 31 – 32, and 34 should also be found allowable.

Claims 18 – 20, 22, and 29 were rejected under 35 U.S.C. 103(a) as being unpatentable

over Kawai in view of Progar.

Response

Claim 18

Claim 18 has been amended to more explicitly state that if compensation with the first compensation value results in the count value equaling the threshold value then no more compensation values will be calculated. As neither Kawai nor Progar claim compensating for each time interval error separately, and furthermore claim accumulating all errors over a set time period, applicant asserts that Claim 18 overcomes the prior art rejection. This is because neither Kawai nor Progar teach utilizing a comparison between the threshold value and the count value as a means of determining whether to calculate a single error compensation value. Claim 18 claims a system where each error value is calculated and applied individually, and where the calculation of each error value is dependent on the comparison between the threshold value and the count value.

Claims 19 – 20, 22, and 29

Claims 19 – 20, 22, and 29 are dependent on Claim 18. As applicant believes Claim 18 has been placed in a position for allowance, claims 19 – 20, 22, and 29 should also be found allowable.

Claim 21 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Progar and further in view of Lode.

Response

Claim 21 is dependent on Claim 18 and should be found allowable if Claim 18 is found allowable.

Claim 23 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Progar and further in view of Hirose.

Response

Claim 23 is dependent on Claim 18 and should be found allowable if Claim 18 is found allowable. Additionally, please see arguments for Claim 1 concerning the use of integer versus float compensation values.

Claims 26 and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Progar and further in view of Chapman.

Response

Claims 26 and 28 are dependent on Claim 18 and should be found allowable if Claim 18 is found allowable.

Claims 16 and 33 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai in view of Chapman and Progar and further in view of Lode.

Response

Claim 16

Claim 16 is dependent on Claim 13 and should be found allowable if Claim 13 is found allowable.

Claim 33

Claim 33 is dependent on Claim 30 and should be found allowable if Claim 30 is found allowable.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Sincerely yours,

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